STATE OF VERMONT

BEFORE THE PUBLIC SERVICE BOARD

Investigation into Proposed Sale of	**)**	
Vermont Yankee Nuclear Power Station	**)**	**Docket No. 6545**
to Entergy Nuclear Vermont Yankee, LLC,	**)**	
and Related Transactions	**)**	

DIRECT TESTIMONY OF

PAUL L. CHERNICK

ON BEHALF OF

THE DEPARTMENT OF PUBLIC SERVICE

Resource Insight, Inc.

JANUARY 7, 2002

This Testimony Has Been Edited to Omit Confidential Information

Summary: Mr. Chernick's testimony compares the value of the proposed sale to the value of other nuclear power-plant sales, and reviews the conduct of the auction, the follow-up to bidder offers, and the evaluation of the bids.

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EXHIBITS

I. Identification and Qualifications

Q: State your name, occupation and business address.

A: I am Paul L. Chernick. I am the president of Resource Insight, Inc., 347 Broadway, Cambridge, Massachusetts 02139.

Q: Summarize your professional education and experience.

A: I received an SB degree from the Massachusetts Institute of Technology in June, 1974 from the Civil Engineering Department, and an SM degree from the Massachusetts Institute of Technology in February, 1978 in technology and policy. I have been elected to membership in the civil engineering honorary society Chi Epsilon, and the engineering honor society Tau Beta Pi, and to associate membership in the research honorary society Sigma Xi.

I was a utility analyst for the Massachusetts Attorney General for more than three years, and was involved in numerous aspects of utility rate design, costing, load forecasting, and the evaluation of power supply options. Since 1981, I have been a consultant in utility regulation and planning, first as a research associate at Analysis and Inference, after 1986 as president of PLC, Inc., and in my current position at Resource Insight. In these capacities, I have advised a variety of clients on utility matters. My work has considered, among other things, the cost-effectiveness of prospective new generation plants and transmission lines; retrospective review of generation planning decisions; rate-making for plant under construction; ratemaking for excess and/or uneconomical plant entering service; conservation program design; cost recovery for utility efficiency programs; the valuation of environmental externalities from

energy production and use; restructuring of electric and gas utilities; asset sales and mergers; and power supply arrangements. My resume is appended to this testimony as Exhibit DPS-PLC-1.

Q: Have you testified previously in utility proceedings?

A: Yes. I have testified approximately one hundred and eighty times on utility issues before various regulatory, legislative, and judicial bodies, including utility regulators in twenty-five states, New Orleans, the District of Columbia, and Ontario; the Federal Energy Regulatory Commission; the Atomic Safety and Licensing Board of the U.S. Nuclear Regulatory Commission; and various siting and environmental regulators. A detailed list of my previous testimony is contained in my resume.

Q: Have you testified previously, in connection with regulatory review of the sale of power plants?

A: Yes. I have testified on the sales of the fossil assets of Atlantic City Electric (New Jersey BPU Docket No. EM00020106), the multiple-owner Centralia coal plant to TransAlta (Utah PSC Docket No. 99-2035-03), and the Millstone nuclear power plant (Connecticut DPUC Docket No. 99-09-12RE01). My resume details this experience.

Q: Have you testified previously before the Board?

A: Yes. I testified in the following cases:

- Docket No. 4936, on Millstone 3;
- Docket No. 5270 on DSM cost-benefit test, pre-approval, cost recovery, incentives, and related issues;
- Docket No. 5330, on the conflict between the HQ purchase and DSM;

- Docket No. 5491, on the need for HQ power and the costs of alternative purchases;
- Docket No. 5686, on the avoided costs and water-heater load-control programs of Central Vermont Public Service (CVPS);
- Docket No. 5724, on CVPS avoided costs;
- Docket No. 5835, on design of CVPS load-management rates;
- Docket No. 5980, on electric-industry restructuring and avoided costs;
- Docket No. 5983, on the prudence of Green Mountain Power's decisions regarding the HQ contract, avoided costs, and distributed utility planning;
- Docket No. 6018, on the prudence of CVPS's decisions regarding the HQ contract, avoided costs, and distributed utility planning;
- Docket No. 6107, on the prudence of GMP's decisions regarding the HQ contract and distributed utility planning;
- Dockets Nos. 6120 and 6460, on the prudence of CVPS's decisions regarding the HQ contract.

Q: Have you been involved in other aspects of utility planning and regulation in Vermont?

A: Yes. My other activities have included the following

- participation in the CVPS and Vermont Gas DSM collaboratives;
- preparation of testimony on the avoided costs of Green Mountain Power in Docket No. 5780, not presented due to settlement of the case;
- assisting the Department of Public Service (DPS or the Department) in the power-supply negotiations of the externalities investigation;
- providing consulting support to the Vermont Senate on stranded costs and Vermont Yankee economics;

- assisting the Burlington (Vermont) Electric Department on distributed utility planning;
- assisting the Department in the statewide collaborative on distributed utility planning.

Q: Are you the author of any publications on utility planning and ratemaking issues?

A: Yes. I am the author of a number of publications on rate design, cost allocation, power-plant cost recovery, conservation-program design and cost-benefit analysis, and other ratemaking issues. These publications are listed in my resume.

II. Introduction

Q: On whose behalf are you testifying in this proceeding?

A: I am testifying on behalf of the Vermont Department of Public Service.

Q: What is the purpose of this testimony?

A: I address four subjects related to the sale of the Vermont Yankee nuclear power plant by its current owner, the Vermont Yankee Nuclear Power Corporation (VYNPC), to Entergy Nuclear Vermont Yankee (ENVY). First, I compare the proposed sales price for Vermont Yankee to prices of other nuclear plants sold for operation in the competitive market. Second, I review the auction process. Third, I review the follow-up by J.P. Morgan and Vermont Yankee regarding the options offered by ENVY in its bid. Fourth, I review the evaluation of the final bids for the plant, conducted by J.P. Morgan on behalf of VYNPC.

I address these subjects in response to Issue 1 specified by the Board with respect to the proposed transfer, in its 11/5/2001 Order Re: Scope And Schedule

(4): "A review of the sponsors' bid solicitation and negotiation processes, to consider whether their conduct has maximized the benefits of the transfer to ratepayers and the state as a whole."

Q: What do you conclude from your comparison of the proposed price for Vermont Yankee to the sales prices of other nuclear plants?

A: There are no close comparables to the proposed sale of Vermont Yankee. The value of the proposed transaction is toward the bottom of the range of other recent nuclear sales. The relatively low price for Vermont Yankee may be explained, in whole or in part, by its age and size, and may be reasonable when compared to other recent transactions.

Q: What are your conclusions regarding the auction process?

A: It is difficult to evaluate the management of an auction process from documents alone, since the effectiveness of the auction depends on the quality of communications between the participants and the auction manager.

With those limitations in mind, J.P. Morgan appears to have structured the auction in an appropriate manner. I have not identified any problems in the operation of the auction. Nonetheless, ...

.....

Q: What are your conclusions regarding the performance of J.P. Morgan and VYNPC in following up on the .....?

A: J.P. Morgan and VYNPC did not determine the costs and benefits of ...., and did not follow up on .....with further discussion or negotiation. It is not clear whether ..... would have ultimately added to the value of the transaction to the sponsors. As a result, the question that the Board raised in Issue 1 in its order of November

5, 2001, "whether their conduct has maximized the benefits of the transfer," cannot be answered.

Q: What are your conclusions regarding J.P. Morgan's evaluation of the final bids for Vermont Yankee?

A: J.P. Morgan included all the components of value that varied among the offers. With a few exceptions, J.P. Morgan appears to have reasonably modeled those components.

As I explain in §VI below, the exceptions occur in the modeling of the purchased-power agreement, where several of J.P. Morgan's assumptions and methods are either questionable or incorrect.

III. Comparable Sales Analysis

A. The Basis for Valuation

Q: How are the sales prices for nuclear plants generally expressed?

A: There is a great deal of variation in the form in which the value of a nuclear plant sale may be stated.[1] The value of the sale certainly includes any cash payment for the plant at the time of closing. In addition, various reports of the sales value of nuclear assets include the following components:

- cash for materials and fuel;
- deferred payments for plant, materials, and fuel, often structured as a note from the buyer to the seller;

[1]Many of the same issues arise in the sale of non-nuclear generating assets. Some issues are unique to nuclear assets (such as decommissioning).

- reduction in the seller's potential liability for nuclear decommissioning;
- the difference (which may be positive or negative) between projected market power prices and the price of a plant-contingent purchased-power agreement (PPA) from the plant buyer to the seller;
- the expected value of a revenue-sharing agreement, under which the buyer will pay the seller a fraction of the plant's revenue, if market prices rise above a target level;
- payment by the seller to "top off" nuclear decommissioning funds, often to the minimum level required by the NRC for nuclear plants that are not subject to cost-of-service regulation;
- other fixed or contingent payments, such as (a) sharing of property-tax payments and refunds, (b) sharing of insurance refunds, (c) bonuses if the buyer also acquires other nearby plants, (d) sharing of O&M costs during some transition period.

Q: Does this accounting for the sales value reflect the total benefit to the seller, or the total cost to the buyer, from the transaction?

A: Not necessarily. The value of the sales transaction does not usually include all the ongoing costs and benefits of the transaction. The seller, for example, saves the O&M, property taxes, and insurance associated with the plant, but loses the value of its energy and capacity. The buyer assumes the O&M, property taxes, and insurance, and gains the revenues from the plant's output.

Thus the reported value of nuclear sales is often greater than the cash payment for the plant, but is not the same as a full accounting of costs and benefits for either the seller or buyer.

Q: Are there any complications in interpreting the value of a nuclear transaction?

A: Yes, numerous such complications and ambiguities arise with respect to nearly every aspect of nuclear transactions, other than the cash price for the plant itself.

- Some tabulations of nuclear sales do not include the cash payments for nuclear fuel and materials as part of the plant value. The irradiated fuel has little or no value (or perhaps a negative value, for storage and disposal costs), and the materials have little value without the plant. Consequently, payments for these items should be considered payments for the plant.
- In transactions that include delayed payments, those payments may be presented at their nominal value (without discounting for the delay), or discounted at a discount rate. The discount rate may be derived from the sales agreement (such as the interest rate on any notes issued for delayed payments), representing the seller's cost of capital, or representing the buyer's cost of capital.[2]
- The benefit to the seller of reducing its decommissioning liability may be measured against what it already has in its decommissioning fund (in which case any top-off payment is a cost), the NRC's generally lower funding targets, the utility's generally higher estimate of decommissioning costs at the end of the plant's license, or the still higher cost of unplanned early decommissioning (which seemed to be a real possibility for Pilgrim and Oyster Creek prior to their sale).

[2]In principle, the discount rate could reflect the inherent risk in the particular cash flow. I have not seen any nuclear sale valuation that used an explicitly risk-adjusted discount rate.

- Similarly, estimates of the timing of decommissioning vary from next year or next refueling, to well beyond the end of the current license life. Valuing a sale as if it avoided the seller buying for immediately shutting down and dismantling the plant will produce a much higher valuation of the transaction than would an analysis that assumes a long life, orderly shutdown, and delayed decommissioning.
- The value of PPAs and Revenue-Sharing Agreements (RSAs) depend on the expected value of future power prices; the value of an RSA also depends on the distribution of prices around the expected value.[3]
- Some nuclear sales provide that the buyer will flow through to the seller the return of payments the seller made previously, such as for outage insurance or for disputed property taxes. Whether this is regarded as an additional benefit to the seller depends on whether the payment stream is thought of as part of the plant, or as already belonging to the seller.
- Some transactions include hard-to-value non-cash components (such as the coal plants Duquesne-FirstEnergy swapped for nuclear shares).
- Some terms of nuclear deals are not fully public. For example, GPU disclosed that its agreement to sell its Three Mile Island 1 unit to AmerGen included an RSA, and the maximum benefit from the RSA, but did not disclose such details as the strike price at which the RSA would take effect.

As a result, the same information about a nuclear-plant sale can produce widely different valuations of the transaction, depending on the assumptions made about future decommissioning costs, market prices, and other factors.

[3]In a typical revenue-sharing agreement, the buyer pays the seller a percentage of the difference between the actual market price and a predetermined reference price, times the plant's output.

Q: How have you dealt with these uncertainties and complications?

A: I include a range of available estimates for PPAs, decommissioning, and other adjustments.[4] Exhibit DPS-PLC-2 lists the nuclear sales and for each provides some information (capacity, percentage of each unit, life remaining on the NRC operating license) and the values of the sales, interpreted in multiple ways.

Q: Are any broad trends evident in the data in Exhibit DPS-PLC-2?

A: Yes. There is a clear split between the sales that were announced prior to January 2000, and those after that date. The earlier group comprises the following nine sales and two proposed sales:

- Two small, old single-unit plants (Pilgrim and Oyster Creek), which are in some ways comparable to Vermont Yankee.
- Two larger, newer single-unit plants (Clinton, TMI 1).
- Five sales of minority portions of one or more plants (Montaup's sale of its Seabrook share, the transfer of the bankrupt Cajun Coop's share of River Bend to Entergy, Duquesne's sale of Beaver Valley and Perry, and Conectiv's sale of Hope Creek and Salem to PSEG Power and of Peach Bottom to both PSEG Power and Excelon).
- Two sales to AmerGen announced in 1999, but never consummated: the original proposal to sell Vermont Yankee, and the proposal of NiMo and NYSEG to sell Nine Mile Point 1 and their shares of Nine Mile Point 2.

[4]Some of the values of reduced decommissioning payments are from J.P. Morgan's discovery responses. Mr. Dabbar asserts that "JP Morgan uses press releases, 8Ks, and other public documents when compiling its comparable transactions statistics," but that "These documents are not saved by JP Morgan." (VY:DPS:2-73)

Q: How useful are these early sales in evaluating the price ENVY has offered for Vermont Yankee?

A: These sales are of limited relevance, for several reasons.

First, in the early years of restructuring (1996–1999), the general perception was that most nuclear plants were of little value, O&M costs would continue to be high, capacity factors would remain low, market prices for electric energy would be low, and that the issues of risk, spent-fuel disposal and decommissioning would result in negative net values for most plants. Much of the perceived value in the sales lay in the elimination of risk of operating and decommissioning costs.

Second, several of the early sales were of minority shares (sold by Montaup, Conectiv, Duquesne, and Cajun). Minority shares are often less valuable than controlling shares, and especially less than 100% ownership, for two reasons. Minority owners generally have little voice in the operation of a power plant. Since the value of a nuclear plant depends critically on how well it is operated, and the potential purchasers clearly believe they are able to operate plants reliably and economically, potential purchasers may not be much interested in owning a small portion of a plant controlled by someone else.

Minority ownership is also less valuable, because the co-owners of power plants generally possess the right of first refusal.[5] It is widely recognized that the existence of a right of first refusal can depress the price of assets sold at auction.

[5]A right of first refusal generally provides that, should any participant decide to sell its share, each other participant has the right to match any offer that the seller may accept from a third party. Among other things, these provisions assure the participants in the enterprise that they can choose to increase their share, rather than deal with a new and perhaps undesirable associate.

As a witness for Northeast Utilities in the Connecticut proceeding on the sale of Millstone, said:

> A right of first refusal possessed by a third party could lower the value of an asset to be sold in an auction. Prospective bidders may be less likely to spend the necessary resources in preparing a bid for an asset where there is a high likelihood that a third party will exercise this right. Consequently, there could be fewer and less serious bidders and thus theoretically a tendency for auction prices to be lower.[6]

In other words, a bidder will tend to be less aggressive in its bidding if it knows that, should it get a good price, a co-owner can take the asset away for the same price. Rights of first refusal have been invoked at least twice in the sale of power plants:

- In November 1998 Pacific Gas and Electric selected FPL Group to purchase its Geysers geothermal capacity. In January 1999 the minority owner of the steam field (Calpine) bought out the majority owner and exercised its joint right of first refusal, acquiring the plants at the price negotiated by FPL.
- In June 1999 Niagara Mohawk attempted to sell its shares of Nine Mile Point 1 and 2 (100% and 41%, respectively) and NYSEG's 18% share of Unit 2 to AmerGen through an exclusive negotiation process. This attempt failed when Rochester Gas & Electric, owner of 14% of Unit 2, exercised its right of first refusal. While Rochester Gas & Electric would be the nominal purchaser, it had partnered with Entergy, which would assume responsibility for funding the acquisition and operating the plant, and would assume all associated risks. The sale was subsequently cancelled.

[6]Robert T. McWhinney, President and Chief Executive Officer of Stone & Webster Management Consultants, CDPUC Docket 99-09-12, in response to OCC-021.

All of the sales of minority shares of nuclear plants have been to joint owners. These sales cannot be considered to be fully competitive.

Third, some of the early nuclear sales involved non-cash values that are difficult to quantify. The most striking case is that of Duquesne, which traded minority shares in several coal units, as well as in three nuclear units, for sole ownership of several coal units of various vintages. The valuation of the nuclear assets depends on the value assumed for both the minority coal-plant shares and the wholly owned coal plants.

Q: What was the second group of nuclear sales?

A: Since January 2000, the following five sales have been announced:

- NYPA's sale to Entergy of its Fitzpatrick and Indian Point 3 nuclear power plants.
- The re-auctioning of the Nine Mile Point units, including all of Unit 1 and 82% of Unit 2, resulting in their sale to Constellation.
- Con Edison's sale of the Indian Point 2 unit to Entergy.
- The sale of Millstone 2 and 93.5% of Millstone 3 by Northeast Utilities to Dominion.
- The proposal of Southern California Edison to sell its 16%, 590 MW share of the Palo Verde nuclear plant in Arizona and its 48% 710 MW share of the coal-fired Four Corners plant in New Mexico to Pinnacle West. Pinnacle is the holding company for Arizona Public Service, which is a part owner and operator of both plants.

The proposal in this proceeding to sell Vermont Yankee constitutes the sixth proposed sale since January 2000. The auction of Seabrook is under way.

Q: How useful are these later sales in evaluating the price ENVY has offered for Vermont Yankee?

A: The first four sales on the post-2000 list, above, are more relevant to the current proposal than are the earlier sales. They represent recent expectations regarding decommissioning liabilities, nuclear performance and electric market prices.

Vermont Yankee's location is comparable or superior to the units in the other recent Northeastern nuclear sales. Millstone is in New England, and market prices would tend to be similar for Vermont Yankee and Millstone. The Fitzpatrick and Nine Mile plants are located in western New York State, where market prices tend to be lower than in New England. These regional market-price differences are illustrated in Exhibit DPS-PLC-3.

The NYPA sale was the result of an exclusive negotiation with Entergy, rather than an auction. An unsolicited bid from Dominion resulted in Entergy's improving its bid somewhat, but the price may have been depressed by the lack of full competition.

On the other hand, there are factors that would tend to increase the value per kilowatt of at least some of these other Northeastern nuclear plants relative to Vermont Yankee.

- The individual units are larger, ranging from 610 MW for NMP 1 and 820 MW for FitzPatrick, to over 1,000 MW for Millstone 3 and NMP 2, compared to Vermont Yankee's 510 MW. Larger generators tend to have lower O&M costs per kilowatt.
- Nine Mile Point and Millstone each have two operating units on the same site. While each of the NYPA plants was nominally a single unit, Indian Point 3 is adjacent to Indian Point 2; when Entergy was bidding on the

latter unit, it was essentially bidding to acquire a two-unit plant. Multiple units on a site share costs, which tends to make them less expensive to operate than single-unit plants, on a dollar-per-kilowatt basis.[7]

- Other than Nine Mile 1, the other units are all younger than Vermont Yankee, giving them more years of operation before they face relicensing. Their more-recent designs may be easier and less expensive to relicense. Age, size, and siting differences are summarized in Exhibit DPS-PLC-4.

Q: Please describe the attempt to sell Palo Verde.

A: Southern California Edison attempted to sell its share of Palo Verde together with its share of Four Corners. Initially, the utility negotiated a sales price for its shares in the two plants to Pinnacle West. The agreement with Pinnacle West allowed other parties to make competing offers for Four Corners, or for the two plants together, but did not allow bids for Palo Verde separately from Four Corners, and gave Pinnacle West the right of first refusal for any bid.

An alternative bid was received for Four Corners, but not for the two plants together. The transaction never closed, due to the rapid escalation of electricity prices in the West and a legislative prohibition on generation-asset sales.

The peculiar nature of the Palo Verde auction, the minority status of Southern California Edison's share, and the prohibition on competing bids for the nuclear assets without the coal plants, as well as the prospect of legislation banning the sale, may all have discouraged bidders and reduced the bid price.

[7]Part of the extra value of a two-unit site is reflected in Entergy's purchase agreement with NYPA, which provided for an additional $25 million payment if Entergy acquired Indian Point 2, and a similar payment if Entergy acquired Nine Mile Point, which is adjacent to FitzPatrick.

Nonetheless, Pinnacle West offered more cash per kW for Palo Verde capacity than Entergy has offered for Vermont Yankee.

B. Valuation of Past Sales

Q: What range of valuations have you estimated for the early group of nuclear sales?

A: Most of the sales announced prior to 2000 were for prices in the $100/kW–$200/kW range, although some were lower and some—depending on the interpretation of the decommissioning costs and the valuation of the Duquesne coal plants—may have been worth more than $500/kW.

Q: What range of valuations do you estimate for the more-recent sales?

A: The post-1999 nuclear sales included $322/kW to $779/kW in cash and/or notes, expressly for plant, fuel and materials and supplies. In addition,

- The NYPA sale included a PPA (which NYPA considered to be at market prices) to cover NYPA's remaining contract obligations for power from each unit, plus another lower-priced PPA for uncommitted power from Fitz-Patrick for four years, plus payment streams designated as being related to repaying NYPA's decommissioning contribution and for compensating NYPA for entering into the second FitzPatrick PPA, an RSA, and bonus payments if Entergy acquired NMP or Indian Point 2.
- The Indian Point-2 sale included a PPA that Con Edison has described as being below market price, as well as sharing of the savings from deferred decommissioning (Order in NYPSC Case 01-E-0040 (August 31, 2001):6).

- The Nine Mile Point sale included PPAs covering 90% of plant output for the remaining license life of Unit 1 and 10 years of Unit 2, as well as an RSA for Unit 2 for the subsequent 10 years.

Exhibit DPS-PLC-5 summarizes these payments.

Including the present value to the seller of all these other cash-flow streams, the values of the sales rise to roughly $400–$900/kW. For at least some of the sales, reduction in decommissioning obligations may add to the value.

Q: How do these prices compare to the price Entergy has offered for Vermont Yankee?

A: The cash portion of the proposed Vermont Yankee sale is $353/kW, which would be towards the bottom of the range of recent sales, comparable to the prices for the NYPA plants and for NMP 1. Both NMP and NYPA's FitzPatrick are in western New York, where energy prices are lower. Also, NYPA's sale was not fully competitive.

If one accepts the value of the PPA estimated by J.P. Morgan, the value of the Vermont Yankee sale would rise to almost $700/kW, towards the high end of the range of sale values (including all cash flows except avoided decommissioning). As I explain below, and as discussed in more detail in the testimony of DPS Witness Bruce Biewald, J.P. Morgan has overestimated the value of the Vermont Yankee PPA. Using the corrected costs and benefits supported by DPS witnesses Biewald, Schlissel and Sherman, the Vermont Yankee transaction value is under $400/kW. The LMA would also add some additional value to the transaction.

Q: What do you conclude from your comparison of the proposed price for Vermont Yankee to the sales prices of other nuclear plants?

A: In the analysis I describe above, the value per kilowatt offered for Vermont Yankee in the proposed transaction appears to be at the bottom of the range of recent nuclear sales. However, as I discuss above, the determination of the value of these transactions is inherently imprecise. In addition, the other recent sales are not closely comparable to the proposed sale of Vermont Yankee, which is a single 510 MW unit from the early 1970s, while other recent sales are predominately of larger multi-unit plants from the late 1970s and 1980s.

Overall, considering the differences between the characteristics of Vermont Yankee and the plants in the other recent sales, the price proposed in this transaction may be reasonable when compared to other recent transactions.[8]

IV. Review of Auction Process

Q: What aspects of the auction process did you review?

A: I reviewed the documentation provided by J.P. Morgan and Vermont Yankee regarding the following aspects of the auction:

- potential bidders contacted
- the structure of the auction
- the encouragement and support of potential and actual bidders through the auction process
- arrangements for due diligence by final bidders

[8] This conclusion is consistent with the findings of Monika Eldridge in Docket No. 6300. Using a different methodology, and an older market-price forecast, she found that the final price proposed by AmerGen resulted in "a similar or slightly lower price-to-value ratio than the latest nuclear asset transactions, and the price being offered by AmerGen Vermont is fair and reasonable." (Supplemental pf, 12/15/2000, at 3).

- the decision to proceed to final negotiations.

Most of these activities were actually undertaken by J.P. Morgan.

Q: Did J.P. Morgan contact an appropriate group of potential bidders?

A: J.P. Morgan appears to have contacted all the parties that would have been likely to bid on Vermont Yankee, as follows.

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[redacted]

[redacted]

The auction was extensively reported (as was AmerGen's previous attempt to purchase the plant), so it is unlikely that any potential bidder was unaware of the auction.

Q: Was the auction structured reasonably?

A: J.P. Morgan appears to have followed the standard design for auctions of generation assets.

In many auctions, non-binding indicative bids are requested, to assess the level of interest of bidders and, in multiple-asset auctions, assist in defining bundles of assets for the binding bids. I do not believe that the omission of this step in the Vermont Yankee auction sacrificed much information of value.

Q: How did J.P. Morgan perform in encouraging and supporting bidders?

A: This aspect of the auction is particularly difficult to review. J.P. Morgan has not provided a detailed paper trail of its interactions with potential bidders.

[redacted]

[redacted]

[redacted]

Q: Is it clear what happened to the other potential bidders?

A: [redacted]

[redacted]

[redacted]

[redacted].

[redacted]

[redacted]

[redacted]

Q: Were the arrangements for due diligence adequate?

A: J.P. Morgan seems to have provided a large amount of data and made additional documents and plant inspections available. I cannot determine from the information provided whether [redacted]

Q: Did J.P. Morgan and VYNPC properly handle the decision to proceed to final negotiations?

A: The critical issue here was [redacted]

[redacted]

Whatever flaws it might have had, the auction produced a substantial bid. I see no reason for J.P. Morgan and VYNPC to have abandoned the auction process at that point. They properly identified the high bidder; proceeding to final negotiations offered the best hope for the highest price, given the circumstances at that time (late July 2001).

V. Follow-Up to Alternative Offers in Bids

Q: What alternative terms were offered by the bidders?

A: The Entergy Bid Letter offered to [redacted]

- [redacted]
- [redacted]

[redacted]

- .....
- .....
- .....

Q: How did J.P. Morgan and VYNPC follow up on these offers?

A: That is difficult to say. VYNPC and J.P. Morgan were unable to provide any documentation (including communications ....., internal documents, emails, and notes of telephone conversations) of their negotiations with .....

Q: What did VYNPC do with regard to the .....

.....

Q: What did VYNPC do with regard to

A:

Q: Did J.P. Morgan respond to

This response is troubling for several reasons.

Q: What became of

A:

Q: Did J.P. Morgan pursue

A:

Q: Do we know what

A:

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Q: Please summarize your conclusions regarding the response by VYNPC and J.P. Morgan to .....

A: Since J.P. Morgan and VYNPC .....

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Q: Had J.P. Morgan negotiated for some change of value to the Vermont Yankee owners, would Entergy have necessarily demanded an equal and offsetting change in some other financial term?

A: No. Due to differences in expectations, perceptions and risk aversion between Entergy and the Vermont Yankee owners, the negotiations would not necessarily represent a zero-sum game. For example, ...

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.....

.....

[redacted]

VI. The Bid-Evaluation Process

Q: What bids did J.P. Morgan evaluate for VYNPC?

A: [redacted]:

[redacted][14]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[14]The output of Vermont Yankee covered by the PPA does not include any output made possible by increasing the plant's capability.

[redacted]

[redacted]

Q: Did J.P. Morgan properly evaluate the alternative bids?

A: The numerical evaluations of the bids included all of the readily quantifiable elements of value: cash for the plant, fuel, and materials and supplies; the present value of the PPA, including an attempt to value the LMA; required VYNPC contribution to employee pension funding; and the present value of payments [redacted] The inputs to these numerical evaluations, such as the discount rate used to present-value the PPA, are generally appropriate, with the exception of the PPA.

Q: What were the problems in J.P. Morgan's valuation of the PPA?

A: I have identified three such problems. First, J.P. Morgan used [redacted]

Second, J.P. Morgan appears to have omitted [redacted]

Third, J.P. Morgan erred in modeling the Low Market Adjuster in the PPA.

Q: How did J.P. Morgan err in modeling the Low Market Adjuster in the PPA?

A: The Low Market Adjuster provides that, whenever the 12-month running average of actual ISO-NE market prices falls below 95% of the contract price, the PPA price will be reduced to 105% of the market price. "Market price" is defined as 110% of the average NEPOOL energy price for the month.[16]

The value of the LMA thus depends on the difference between the contract price and the forecast market price, and on the variability of the actual price around the forecast. J.P. Morgan estimated the value of the LMA with a Monte Carlo simulation. That is, J.P. Morgan ran random future market price forecasts through the LMA computation, selected the lower of the contract price or 105% of the market price for each month (depending on whether the LMA was triggered for the month), and averaged the results.

J.P. Morgan erred (1) in

Q: Why does the forecast matter in the valuation of the LMA?

A: A higher base-price forecast makes it less likely that the market price, when adjusted randomly, will fall below 95% of the contract price, triggering the LMA. Even if the simulated market price triggers the LMA, a higher base price forecast will result in a higher market price, reducing the value of the LMA.

[16]If a market for installed capacity is re-established, the market clearing price for capacity can replace the 10% adder on energy.

Q: How did J.P. Morgan use monthly prices?

A: Since the LMA is computed monthly, comparing the current contract price to the running 12-month average market price, J.P. Morgan modeled monthly market prices.

[redacted]

Q: What was J.P. Morgan's error with respect to the variation in the actual price around the forecast?

A: The sort of analysis that J.P. Morgan performed requires that a standard deviation be applied to the forecasted price in a month, to produce a simulated

actual monthly price from that forecast monthly price. To estimate such a standard deviation, one might compare the price projected for a particular month in earlier forecasts to the actual price in the month, and compute the difference between the forecast price and the actual price. Using several forecasts of various vintages and the available data on market prices, one could determine the standard deviation of those differences. If it is reasonable to expect that the dispersion of future actual prices around the current forecast will be similar to the dispersion of actual market prices around the earlier forecasts, the standard deviation computed from the historical data can be used in evaluating the LMA.

J.P. Morgan's derivation of a standard deviation had no connection to the dispersion of actual prices around a forecast, and the resulting estimate is entirely irrelevant to the valuation of the LMA. Instead, J.P. Morgan computed

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Q: What about the final evaluations of the options?

A: The choice of Entergy .....was clearly correct, as was the preference for Entergy's bids with .....

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J.P. Morgan and VYNPC have not explained clearly the choice of .....

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Q: Were the choice of the winning bidder and the value of the sale affected by shortcomings in the auction process, the lack of response to the ....

, and problems in J.P. Morgan's evaluation of the bids?

A: Based on the information provided by the Petitioners, there is nothing to indicate that the auction process discouraged a potential higher bidder. There is no way of knowing whether the lack of ..... resulted in any benefits being left on the table. Entergy was clearly the high bidder, but it is not clear .....

As a result, I cannot determine whether correcting J.P. Morgan's analysis would have changed VYNPC's decision.

Q: Does this conclude your testimony?

A: Yes.

Exhibit DPS-PLC-2:
Valuation of Nuclear Asset Transfers

Sale Dates							Years left on		Cash at Closing for					Decom funding w/ 2%		$/kW	$/kW w/ Decom	$/kW w/o Decom
Deal	**Closed**	**Unit(s)**	**Seller**	**Buyer**	**MW**	**% sold**	**license**	**Case**	Plant	Fuel	**Later Cash**	**PPA**	**Other Payment**	**real return**	**Total**	**cash**	**funding**	**funding**
Jun-98	Jan-00	Seabrook	EUA (Montaup)	BayCorp	33	2.90%	24		$3.2 M	$1.7 M			$2.5 M		$7.4 M	$147/kW	$222/kW	$222/kW
Jul-98	Dec-99	Three Mile Island 1	GPU	AmerGen	786		14		$23 M	$77 M			$80 M[a]	$7 M	$187 M	$127/kW	$237/kW	$229/kW
Nov-98	Jul-99	Pilgrim	BECo	Entergy	670		12	RII est of market value	$80 M	$41 M		($30)M	$(11)M[b]	$81 M	$161 M	$181/kW	$240/kW	$120/kW
					670			UI est of market price	$80 M	$41 M		($36)M	$(11)M	$81 M	$155 M	$181/kW	$232/kW	$111/kW
Apr-99	Dec-99	Clinton	Illinois Power	AmerGen	930		27		$20 M				$160 M[c]	$126 M	$306 M	$22/kW	$329/kW	$194/kW
Sep-99	Oct-01	Peach Bottom 2, 3	Conectiv	Exelon & PSEG	328	15.02%	11 & 12		$9 M					*not estimated*	$9 M	$29/kW	$29/kW	
Sep-99	Oct-01	Salem 1, 2	Conectiv	PSEG	328	14.82%	14 & 18		$9 M					*not estimated*	$9 M	$29/kW	$29/kW	
Sep-99	Oct-01	Hope Creek	Conectiv	PSEG	52	5.00%	24		$2 M					*not estimated*	$2 M	$30/kW	$30/kW	
Sep-99	Oct-01	Total	Conectiv	PECo & PSEG	709				$21 M	$44 M				$150 M[d]	$215 M	$91/kW	$303/kW	$91/kW
Sep-99	Aug-00	Oyster Creek	GPU	AmerGen	619		9		$10 M		$59 M[e]			$100 M	$169 M	$16/kW	$273/kW	$112/kW
Oct-98	Dec-99	Beaver Valley 1	DQE	First Energy	385	47.53%	26											
Oct-98	Dec-99	Beaver Valley 2	DQE	First Energy	113	13.95%	16											
Oct-98	Dec-99	Perry	DQE	First Energy	161	13.48%	27											
Oct-98	Dec-99	Total	DQE	First Energy	659			30% Discount[f]					$542 M	$105 M	$647 M		$982/kW	$822/kW
					659			Full Value[g]					$115 M	$105 M	$219 M		$333/kW	$174/kW
Jun-99	Cancel	Nine Mile 1	NiMo	AmerGen	610		9		$72 M					$271 M	$343 M	$118/kW	$562/kW	$118/kW
Jun-99	Cancel	Nine Mile 2	NiMO, NYSEG	AmerGen	468	41.00%	28		$64 M					$168 M	$231 M	$136/kW	$494/kW	$136/kW
Oct-99	Cancel	Vermont Yankee	Vermont Yankee	AmerGen	510		10		$24 M					$81 M	$105 M	$46/kW	$205/kW	$46/kW

NOTES

[a] RSA.

[b] O&M support, net of property-tax support.

[c] Does not include buyback (value unknown).

[d] Compared to NRC benchmark.

[e] Refueling costs.

[f] Assumes minority shares of coal plants worth 70% of full control.

[g] No minority discount.

Exhibit DPS-PLC-2:
Valuation of Nuclear Asset Transfers

Sale Dates							Years left on		Cash at Closing for Plant					Decom funding			All But Decom	Including Decom
Deal	Closed	Unit(s)	Seller	Buyer	MW	% sold	license	Case	Plant	Fuel & M&S	Later Cash	PPA	Other Payment	w/ 2%	Total	Cash	funding	funding
Mar-00	Nov-00	Fitzpatrick & Indian Point 3	NYPA	Entergy	1,790	100%	15 & 16	Low RSA Value	$50 M		$631 M	$33 M	$15 M	$264 M	$994 M	$322/kW	$408/kW	$555/kW
Mar-00	Nov-00	Fitzpatrick & Indian Point 3	NYPA	Entergy	1,790	100%	15 & 16	High RSA Value	$50 M		$631 M	$33 M	$128 M	$264 M	$1,107 M	$322/kW	$471/kW	$618/kW
Apr-00	Canceled Apr-01	Palo Verde 1-3	SCEdison	Pinnacle West	602	15.8%	23		$250 M			—		not estimated	$250 M	$415/kW	$415/kW	
Aug-00	Mar-01	Millstone 2	NU	Dominion	875	100%	15		$372 M	$72 M		—			$443 M	$507/kW	$507/kW	
Aug-00	Mar-01	Millstone 3	NU & others	Dominion	1,082	93.5%	25		$751 M	$92 M		—			$843 M	$779/kW	$779/kW	
Aug-00	Mar-01	Millstone 2, 3	NU & other	Dominion	1,957		15, 25		$1,124 M	$164 M		—		$512 M	$1,800 M	$658/kW	$658/kW	$920/kW
Nov-00	Sep-01	Indian Point 2	ConED	Entergy	970	100%	13	Low PPA Value	$372 M	$100 M		$60 M	$30 M	$236 M	$798 M	$487/kW	$579/kW	$823/kW
Nov-00	Sep-01	Indian Point 2	ConED	Entergy	970	100%	13	High PPA Value	$372 M	$100 M		$100 M	$30 M	$236 M	$838 M	$487/kW	$621/kW	$864/kW
Dec-00	Nov-01	Nine Mile 1	NiMo	Constellation	610	100%	9		$117 M		$117 M	$116 M		$56 M	$406 M	$384/kW	$574/kW	$665/kW
Dec-00	Nov-01	Nine Mile 2	NiMO, NYSEG, RG&E, CHG&E	Constellation	936	82%	26	Low RSA Value	$291 M		$291 M	$221 M	$11 M	$33 M	$846 M	$621/kW	$869/kW	$904/kW
Dec-00	Nov-01	Nine Mile 2	NiMO, NYSEG, RG&E, CHG&E	Constellation	936	82%	26	High RSA Value	$291 M		$291 M	$221 M	$151 M	$33 M	$987 M	$622/kW	$1,019/kW	$1,054/kW
Aug-01	Pending	Vermont Yankee	Vermont Yankee	Entergy	510	100%	11	Biewald PPA estimate	$116 M	$64 M		$15 M		not estimated	$195 M	$353/kW	$382/kW	
Aug-01	Pending	Vermont Yankee	Vermont Yankee	Entergy	510	100%	11	JPM PPA estimate	$116 M	$64 M		$173 M		not estimated	$353 M	$353/kW	$693/kW	

Exhibit DPS-PLC-3:
Comparison of Regoinal Market Prices for Power
Around-the-Clock Monthly Average Energy Prices (Dollars per MWh)

	NEPOOL Vermont Yankee & Millstone	**NY ISO Zone C** Fitzpatrick & Nine Mile Point	**Difference**
Dec-99	$24.33	$43.76	-$19.43
Jan-00	$37.15	$33.54	$3.61
Feb-00	$34.17	$24.69	$9.48
Mar-00	$23.90	$22.59	$1.31
Apr-00	$26.17	$27.33	-$1.16
May-00	$72.78	$29.52	$43.26
Jun-00	$38.80	$35.68	$3.12
Jul-00	$37.14	$27.84	$9.30
Aug-00	$42.23	$34.69	$7.54
Sep-00	$43.15	$39.77	$3.38
Oct-00	$50.33	$48.28	$2.05
Nov-00	$49.30	$45.87	$3.43
Dec-00	$62.55	$53.29	$9.26
Jan-01	$62.57	$48.22	$14.35
Feb-01	$43.01	$36.91	$6.10
Mar-01	$50.18	$40.76	$9.42
Apr-01	$36.23	$39.51	-$3.28
May-01	$41.01	$39.57	$1.44
Jun-01	$35.41	$33.48	$1.93
Jul-01	$52.24	$34.90	$17.34
Aug-01	$43.34	$53.07	-$9.73
Sep-01	$31.74	$29.54	$2.20
Oct-01	$30.22	$27.87	$2.35
Average	$42.08	$36.99	$5.10

Exhibit DPS-PLC-4:
Characteristics of Recent Northeastern Plant Sales

Unit(s)	Seller	Purchaser	MW	% sold	Multiple Operating Units on Same Site?	Date of Operation	License Expiration Date	Sale Announced	Licence Years Left	2000 Average Capacity Factor	Reactor Type
Fitzpatrick	NYPA	Entergy	820	100%	If NMP owned	Oct 1974	Oct 2014	Mar 2000	15	83%	BWR
Indian Point 3	NYPA	Entergy	970	100%	If IP2 owned	Apr 1976	Dec 2015	Mar 2000	16	99%	PWR
Millstone 2	NU	Dominion	875	100%	Yes	Sep 1975	Jul 2015	Aug 2000	15	82%	PWR
Millstone 3	NU & others	Dominion	1,082	93.5%	Yes	Jan 1986	Nov 2025	Aug 2000	25	100%	PWR
Indian Point 2	ConEd	Entergy	970	100%	Yes	Sep 1973	Sep 2013	Nov 2000	13	12%	PWR
Nine Mile 1	NiMo	Constellation	610	100%	Yes	Aug 1969	Aug 2009	Dec 2000	9	80%	BWR
Nine Mile 2	NiMo, NYSEG, RG&E, CHG&E	Constellation	936	82%	Yes	Jul 1987	Oct 2026	Dec 2000	26	80%	BWR
Vermont Yankee	Vermont Yankee	Entergy	510	100%	No	Feb 1973	Mar 2012	Aug 2001	11	102%	BWR

Exhibit DPS-PLC-5:
Summary of Contracts Associated with Recent Nuclear Sales

			Purchased Power Agreement				Revenue Sharing Agreement			
					Guaranteed			*Strike Prices*		*% of*
Unit(s)	**Seller**	**Purchaser**	*Term*	*% Unit Output*	*capacity factor*	*Price ($/MWh)*	*Term*	First Year	Last Year	*Excess to Seller*
Fitzpatrick	NYPA	Entergy	2000-2004	37%	85%	32.00	2005-2014	38.01	51.80	50%
Fitzpatrick	NYPA	Entergy	2000-2003	61%	85%	29.00	-	-	-	-
Indian Point 3	NYPA	Entergy	2000-2004	100%		36.00	2005-2014	42.76	58.27	50%
Indian Point 2	Con Edison	Entergy	2001-2004	100%		39.00	-	-	-	-
Nine Mile 1	NiMo	Constellation	2002-2010	90%		35.70 - 36.32	-	-	-	-
Nine Mile 2	NiMO, NYSEG, RG&E, CHG&E	Constellation	2002-2011	74%		35.70 - 36.05	2011-2020	40.75	48.70	80%
Vermont Yankee	Vermont Yankee	Entergy	2002-2012	100%		35.50 - 45.00	-	-	-	-

Notes: The FitzPatrick PPA % are averages over the period of the sales.
The IP2 PPA price is $46.80/MWh in the summer period (June through August), and $36.40/MWh in other months.